



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,075	10/28/2003	George Hsieh	042390P10939D2	5962

7590 06/04/2004

Michael A. Bernadicou
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
----------	--------------

1751

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,075

Applicant(s)

HSIEH ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-30 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 23-30 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/2003.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

- This application is a divisional of currently pending application with serial no.10/039,300 filed 01/02/2002. Acknowledge amendment to the first line of the specification and the canceling of Claims 1-22 with the pre-amendment filed with the application. Claims 23-30 are currently pending with the application.
- Acknowledge the consideration of the IDS filed with application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 23, 25-28, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Weld (US Patent 5,773,322).

Weld discloses a package comprising of molded encapsulated electronic component including a lead frame substrate, wherein the component is coupled to the substrate through an elastomeric, anisotropic and electrically conductive interconnect comprising of a polymer

and conductive particles of cobalt or iron that would meet the limitation of magnetic material and coupling in Claims-23 and 25, and this package would meet the limitation of 'System' in the instant Claims 23-30. Weld further discloses interconnect composition to comprise 25-75 volume % of conductive particles dispersed in the resin that would meet the limitation of instant Claim-27, and the blending of conductive flakes in the interconnect composition would meet the limitation of instant Claim-28. The limitation of matching the thermal expansion of the substrate and the polymer based interconnect would be anticipated to preserve the electrical connection between the points (Abstract, Col-3, Lines: 16-65). All the limitations of the instant Claims are met.

The reference is anticipatory.

2. Claims 23-28 and 30 are rejected under 35 U.S.C. 102(e)/102(a) as being anticipated by Jiang et al (US Patent 6,011,307).

Jiang et al disclose a system comprising of a first electronic component such as PCB or a chip, a second electronic component such as a PCB or lead frame coupled together with a polymer based composition comprising of ferromagnetic particles dispersed in a polymer and aligned magnetically to provide electrical/conductive interconnection that would meet the limitations of the instant Claims 23 and 25-26 (Col-3, Lines: 25-65). Jiang et al disclose the presence of contact pads in the system and their presence in the interconnected electronic system per the limitation of instant Claim-24 would be anticipatory (Col-2, Lines: 33-37).

Jiang et al also disclose the amount of ferromagnetic particles in the composition was between about 10-90% of the interconnecting adhesive material that would meet the

limitation of instant Claim-27 (Col-9, Lines: 19-22), and the dispersed ferromagnetic particles to be elongated and needle-shaped that would meet the limitation of instant Claim-28 (Col-4, Lines: 31-36). Jiang et al further teach the polymer matrix material of the interconnecting adhesive to be hydrophobic and with a low coefficient of thermal expansion mismatch to the first electronic component and the second electronic component that would meet the limitations of instant Claim-30. All the limitations of the instant Claims are met.

The reference is anticipatory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weld et al (US Patent 5,773,322) in view of either Litwin et al (US Patent 5,147,209) or Appelt (US Patent 6,555,762).

The disclosure by Weld on the package comprising of molded encapsulated electronic component system is set forth as above in the rejection-1 under 35 U.S.C. 102(b).

Weld does not teach or suggestive of a screen pad in the system or the use of photo-resists in the polymer of the interconnection.

In the analogous art of interconnections for the PCB's and components, Litwin et al discloses the connections made through the Pads (Abstract, Col-2, Lines: 12-15) and the photo-printing techniques including screen and pad printing using photo-resist polymer compositions (Col-4, Line-65 to Col-5, Line-11).

In the analogous art of electronic packaging, Applet et al teach the compounding of the filler composition of the interconnect to have a coefficient of thermal expansion matching that of the coefficient of thermal expansion such as a dielectric-substrate (Col-3, Lines: 29-48), wherein the interconnecting filler comprised of magnetic nickel/cobalt and a polymer.

It would have been obvious to one of ordinary skill in the art to make modifications to the package comprising of molded encapsulated electronic component system of Weld by optionally including the screen and Pad in the interconnection to benefit from the improved conductive paths, and further optionally include photo resist polymers in the interconnections to benefit from improved circuitry making and conductive tracings in the electronic components and PCB's using photo-resist technique, because Litwin et al teach these aspects and their benefits, and both the teachings are in the analogous art of electronic packaging; and further improvise the interconnection by matching the thermal expansions of the polymer and the substrate per the teachings of Applet to benefit from improved and stable conductive paths, because all the teachings are in the analogous art, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims by the applicants.

2. Claims 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al (US Patent 6,011,307) in view of Litwin et al (US Patent 5,147,209).

The disclosure by Jiang et al on electronic system is set forth as above in the rejection-2 under 35 U.S.C. 102(e)/102(a).

Jiang et al do not teach or suggestive of a screen pad in the system or the use of photo-resists in the interconnection.


In the analogous art of interconnections for the PCB's and components, Litwin et al teach the connections made through the Pads (Abstract, Col-2, Lines: 12-15) and the photo-printing techniques including screen and pad printing using photo-resist polymer compositions (Col-4, Line-65 to Col-5, Line-11).

It would have been obvious to one of ordinary skill in the art to make modifications to the electronic system of Jiang et al by optionally including the screen and Pad in the interconnection to benefit from the improved conductive paths, and further optionally include photo resist polymers in the interconnections to benefit from improved circuitry making and conductive tracings in the electronic components and PCB's using photo-resist techniques, because Litwin et al teach these aspects and their benefits, and both the teachings are in the analogous art of electronic packaging/systems, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims by the applicants.

Conclusion

- The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Baldwin (US Patent 5,946,791) and Seiko-Epson (JP 01-052304).
- Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV
May 28, 2004.


Mark Kopec
Primary Examiner